

CLAIMS

1. A hydrodynamic treatment device for separating material from a liquid flow, the device comprising
5 a vessel having a cylindrical outer wall and an inner partition which divides the interior of the vessel into outer and inner separation regions which communicate with each other across the inner partition, the vessel having an inlet which is
10 directed into one of the inner and outer regions to promote a rotating flow in the vessel, a liquid outlet which extends from the other of the inner and outer regions, and a frustoconical base which converges downwardly to an outlet opening for
15 separated material, the inner separation region being closed at its lower end.
2. A hydrodynamic treatment device as claimed in claim 1, in which the inlet opens into the outer
20 separation region and the outlet opens into the inner separation region.
3. A hydrodynamic treatment device as claimed in claim 1 or 2, in which the inner separation region
25 is annular, and is defined at its inner periphery by a central cylindrical partition, the interior of which is open at its lower end to provide access to the outlet opening.
- 30 4. A hydrodynamic treatment device as claimed in any one of claims 1 to 3, in which the inner separation region communicates with the outer

separation region through at least one aperture formed in the inner partition.

5. A hydrodynamic treatment device as claimed in
5 claim 4, in which the or each aperture is disposed adjacent the lower end of the inner partition.
6. A hydrodynamic treatment device as claimed in
10 claim 4 or 5, in which the aperture comprises a circumferentially extending slot in the inner partition.
7. A hydrodynamic treatment device as claimed in
15 claim 4 or 5, in which the aperture comprises a circumferential gap between the inner partition and a wall closing the lower end of the inner separation region.
8. A hydrodynamic treatment device as claimed in any
20 one of claims 4 to 7, in which the or each aperture is provided with a screen.
9. A hydrodynamic treatment device as claimed in any
25 one of the preceding claims, in which the inner separation region is closed at its lower end by a wall.
10. A hydrodynamic treatment device as claimed in
30 claim 9, in which the wall is frusto-conical and diverges in the downwards direction.

11. A hydrodynamic treatment device as claimed in claim 10, in which the frusto-conical wall projects beyond the inner partition.
- 5 12. A hydrodynamic treatment device as claimed in any one of claims 9 to 11, in which the wall terminates short of the frusto-conical base of the vessel, thereby defining an annular gap between the frusto-conical base and the wall.
- 10 13. A hydrodynamic treatment device as claimed in any one of the preceding claims, in which a filter media is provided in the inner separation region.
- 15 14. A hydrodynamic treatment device as claimed in claim 13, in which the filter media substantially fills the inner separation region.
- 20 15. A hydrodynamic treatment device as claimed in claim 13 or 14, in which the filter media comprises a replaceable cartridge.
- 25 16. A hydrodynamic treatment device as claimed in any one of the preceding claims, in which an outlet duct extends from the liquid outlet through the cylindrical outer wall of the vessel.
- 30 17. A hydrodynamic treatment device as claimed in claim 16, in which an inlet duct extends to the inlet of the vessel through the cylindrical outer wall of the vessel, the inlet duct being aligned with the outlet duct.

18. A hydrodynamic treatment device as claimed in claim 17, in which the inlet is disposed below the inlet duct and comprises an inlet port oriented to discharge inlet flow into the vessel in a tangential direction with respect to the axis of the cylindrical outer wall.
19. A hydrodynamic treatment device as claimed in claim 17 or 18, in which the inlet and outlet ducts are disposed at an upper region of the vessel.
20. A hydrodynamic treatment device as claimed any one of claims 17 to 19, in which the inlet duct communicates with the inlet through a chamber, the chamber being provided with bypass means for allowing flow from the chamber to the inner separation region, by passing the outer separation region.
21. A hydrodynamic treatment device as claimed in claim 20, when appendant to claim 18, in which the inlet port is provided in the wall of an inlet shute which extends downwardly from the chamber.
22. A hydrodynamic treatment device as claimed in claim 21, in which the bypass means comprises a weir disposed between the chamber and the inner separation region, the overflow edge of the weir being at a level higher than the inlet port.

23. A hydrodynamic separator as claimed in any one of the preceding claims, in which the inner partition is cylindrical.
- 5 24. A hydrodynamic separator as claimed in any one of the preceding claims, in which the inner partition is coaxial with the outer wall.
- 10 25. A hydrodynamic treatment device substantially as described herein with reference to, and as shown in, the accompanying drawings.